



Designation: D6792 – 23c

An American National Standard

Standard Practice for Quality Management Systems in Petroleum Products, Liquid Fuels, and Lubricants Testing Laboratories¹

This standard is issued under the fixed designation D6792; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope*

1.1 This practice covers the establishment and maintenance of the essentials of a quality management system in laboratories engaged in the analysis of petroleum products, liquid fuels, and lubricants. It is designed to be used in conjunction with Practice D6299.

NOTE 1—This practice is based on the quality management concepts and principles advocated in ANSI/ISO/ASQ Q9000 standards, ISO/IEC 17025, ASQ Manual,² and ASTM standards such as D3244, D4182, D4621, D6299, D6300, D7372, E29, E177, E456, E548, E882, E994, E1301, E1323, STP 15D,³ and STP 1209.⁴

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory requirements prior to use.*

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:⁵

D630 Specification for Olive Oil Chip Soap (Type A,

Straight; Type B, Blended) (Withdrawn 1979)⁶
D3244 Practice for Utilization of Test Data to Determine Conformance with Specifications
D4057 Practice for Manual Sampling of Petroleum and Petroleum Products
D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
D4182 Practice for Evaluation of Laboratories Using ASTM Procedures in the Sampling and Analysis of Coal and Coke (Withdrawn 2010)⁶
D4621 Guide for Quality Management in an Organization That Samples or Tests Coal and Coke (Withdrawn 2010)⁶
D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance
D6300 Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products, Liquid Fuels, and Lubricants
D6617 Practice for Laboratory Bias Detection Using Single Test Result from Standard Material
D7372 Guide for Analysis and Interpretation of Proficiency Test Program Results
D8428 Guide for Establishing Analyst Competence to Perform a Test Method
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods
E456 Terminology Relating to Quality and Statistics
E548 Guide for General Criteria Used for Evaluating Laboratory Competence (Withdrawn 2002)⁶
E882 Guide for Accountability and Quality Control in the Chemical Analysis Laboratory
E994 Guide for Calibration and Testing Laboratory Accreditation Systems General Requirements for Operation and Recognition (Withdrawn 2003)⁶
E1301 Guide for Proficiency Testing by Interlaboratory Comparisons (Withdrawn 2012)⁶
E1323 Guide for Evaluating Laboratory Measurement Practices and the Statistical Analysis of the Resulting Data

¹ This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.94 on Coordinating Subcommittee on Quality Assurance and Statistics. Current edition approved Nov. 1, 2023. Published November 2023. Originally approved in 2002. Last previous edition approved in 2023 as D6792 – 23b. DOI: 10.1520/D6792-23C.

² “Quality Assurance for The Chemical and Process Industries: A Manual of Good Practices,” 1987, available from American Society for Quality (ASQ), 600 N. Plankinton Ave., Milwaukee, WI 53203. www.asq.org.

³ ASTM STP 15D, *ASTM Manual on Presentation of Data and Control Chart Analysis*, ASTM International, W. Conshohocken, PA.

⁴ ASTM STP 1209, *ASTM Manual on Total Quality Management*, ASTM International, W. Conshohocken, PA.

⁵ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard’s Document Summary page on the ASTM website.

⁶ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard

E2476 Guide for Risk Assessment and Risk Control as it Impacts the Design, Development, and Operation of PAT Processes for Pharmaceutical Manufacture

2.2 *ISO Standards:*⁷

ISO Guide 30 Terms and Definitions Used in Connection with Reference Materials

ISO Guide 73 Risk Management – Vocabulary

ISO 4259-3 Petroleum and related products – Precision of measurement methods and results – Part 3: Monitoring and verification of published precision data in relation to methods of test

ISO 4259-4 Petroleum and related products – Precision of measurement methods and results – Part 4: Use of statistical control charts to validate ‘in-statistical-control’ status for the execution of a standard test method in a single laboratory

ISO 9000 Quality Management Systems – Fundamentals and Vocabulary

ANSI/ISO/ASQ Q9000 Quality Management System Standards

ISO/IEC 17000 Conformity Assessment – Vocabulary and general principles

ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories

ISO 31000 Risk Management – Guidelines

2.3 *Other Standards:*

40 CFR 80 Regulation of Fuels and Fuel Additives⁸

3. Terminology

3.1 *Definitions:*

3.1.1 For a more extensive list of terms used by laboratories engaged in the analysis of petroleum products, liquid fuels, and lubricants refer to Terminology **D4175**.

3.1.2 More extensive lists of terms related to quality management systems are found in ISO 9000 and ISO/IEC 17000, terms related to risk management are found in ISO Guide 73 and ISO 31000, and terms related to quality and statistics are found in Practice **D630** and Terminology **E456**.

3.1.3 *accepted reference value, ARV, n*—a value that serves as an agreed upon reference for comparison, and which is derived as: (1) a theoretical or established value, based on scientific principles, (2) an assigned value, based on experimental work of some national or international organization such as the U.S. National Institute of Standards and Technology (NIST), or (3) a consensus value, based on collaborative experimental work under the auspices of a scientific or engineering group. **E456**

3.1.4 *accuracy, n*—the closeness of agreement between a test result and an accepted reference value. **E456**

3.1.5 *audit, n*—a systematic examination of a laboratory’s quality management system documentation and related activities by an internal or external team to determine conformance

to the applicable quality management system standard, such as described in this practice.

3.1.6 *bias, n*—the difference between the population mean of the test results and an accepted reference value. **E456**

3.1.7 *calibration standard, n*—material with a certified value for a relevant property, issued by or traceable to a national organization such as NIST, and whose properties are known with sufficient accuracy to permit its use to evaluate the same property of another sample.

3.1.8 *certified reference material, CRM, n*—a reference material one or more of whose property values are certified by a technically valid procedure, accompanied by a traceable certificate or other documentation which is issued by a certifying body. **ISO Guide 30**

3.1.9 *correction, n*—action to eliminate a detected nonconformity. **ISO 9000**

3.1.9.1 *Discussion*—A correction may be performed before, during, or after corrective action. **ISO 9000**

3.1.9.2 *Discussion*—Corrections are typically one-time fixes that immediately address the nonconformity, but may not prevent recurrence.

3.1.10 *corrective action, n*—action taken to eliminate the cause of a nonconformity and to prevent recurrence. **ISO 9000**

3.1.10.1 *Discussion*—There can be more than one cause for a nonconformity. **ISO 9000**

3.1.10.2 *Discussion*—Corrective action is taken to prevent recurrence whereas preventive or continuous improvement actions are taken to prevent occurrence. **ISO 9000**

3.1.11 *measurand, n*—the measurable quantity subject to measurement.

3.1.12 *nonconformity, n*—non-fulfillment of a requirement. **ISO 9000**

3.1.12.1 *Discussion*—The non-fulfilment of the requirement may render the quality of the product or service unacceptable, indeterminate, or not according to specified requirements and may be identified through several sources.

3.1.13 *outlier, n*—a result far enough in magnitude from other results so as to be considered not a part of the set. **D6300**

3.1.14 *precision, n*—the closeness of agreement between test results obtained under prescribed conditions. **E456**

3.1.15 *proficiency testing, n*—determination of a laboratory’s testing capability by evaluating its test results in interlaboratory exchange testing or crosscheck programs.

3.1.15.1 *Discussion*—One example is the ASTM D02 committee’s proficiency testing programs in a wide variety of petroleum products and lubricants, many of which may involve more than a hundred laboratories.

3.1.16 *quality assurance (QA), n*—a system of activities, the purpose of which is to provide to the producer and user of a product, measurement, or service the assurance that it meets the defined standards of quality with a stated level of confidence.

3.1.16.1 *Discussion*—Quality assurance includes quality planning and quality control.

⁷ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁸ Available from U.S. Government Printing Office, Superintendent of Documents, 732 N. Capitol St., NW, Washington, DC 20401-0001, <http://www.access.gpo.gov>.